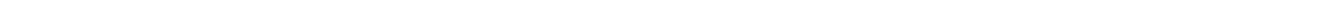
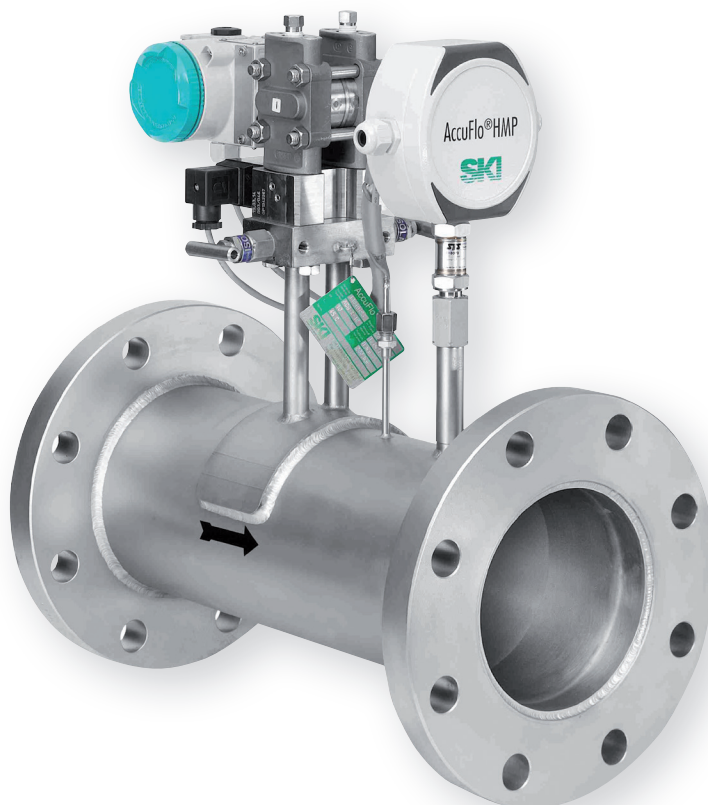


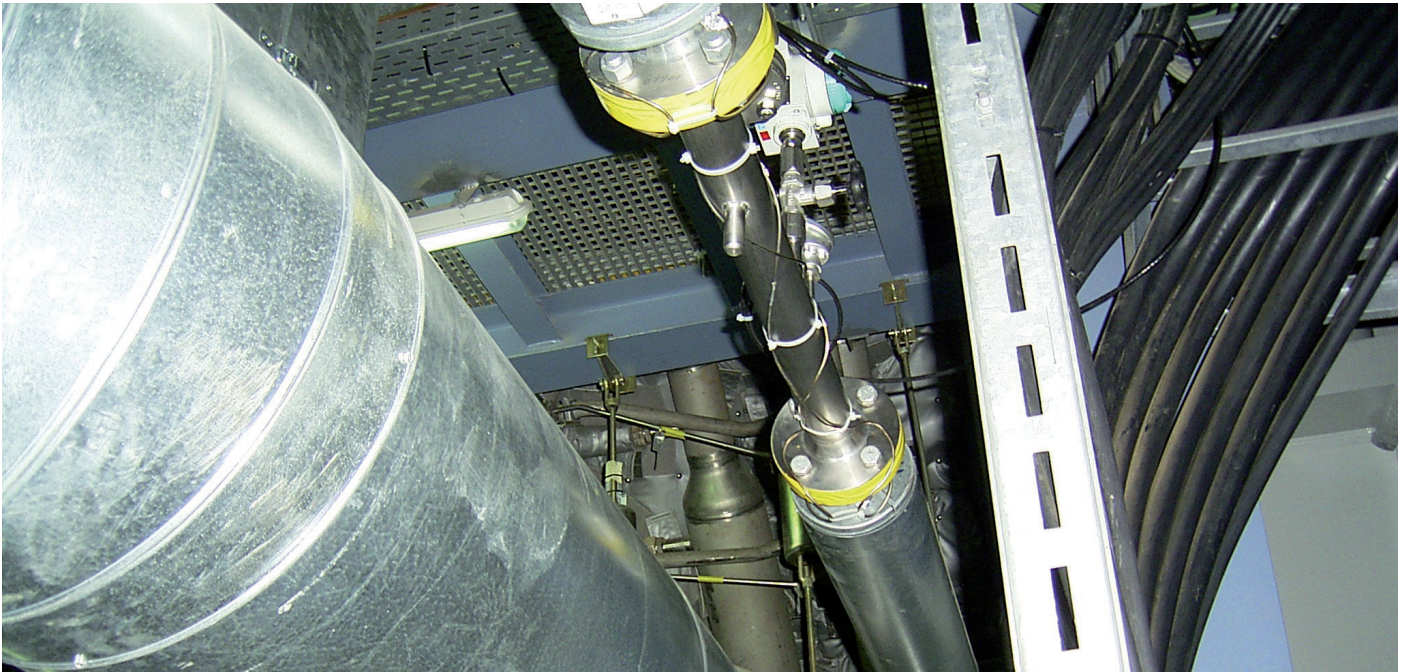
AccuFlo[®] HMP





Our highlights

- “Plug and Play”- system
- Maximum error of 0.3% of measured value
- Almost no straight inlet and outlet sections required
- Dynamic Measuring Ratio of 1:15
- Low pressure drop
- Maintenance-free if AccuFlo®-Zero option is used
- Fiscal measurement for steam, gas and liquids
- Various field bus interfaces available
- Next generation flow computer with touchscreen display and state of the art calculation algorithms



AccuFlo® HMP G – Highly accurate fiscal measurement for gas

Due to the ever increasing energy prices exact flow measurement of gas is becoming increasingly important. This applies to natural gas but also to compressed air and industrial gases. Especially at larger diameters where more energy is transported the AccuFlo® HMP G offers an optimal solution with a diameter range from DN40 to DN300 and a margin of error of up to 0.3% coupled with an excellent price-performance ratio.

An example of the numerous areas of application is the measurement of natural gas as a major energy source. In addition to official custody transfer measurements numerous operational measurements are of particular importance here. Price measurement of gas flow is one a prerequisite for an efficient combustion process.

The AccuFlo® HMP G provides an economically attractive solution, even under the toughest con-

ditions such as strong vibrations of the pipe and high ambient temperatures. The AccuFlo® HMP G is easy to use even in extremely compact installations. It combines very short installation length with minimal to no additional straight inlet and outlet sections in order to meet the specified accuracy.

The measurement system can also be equipped for completely maintenance free operation. Changes in ambient and operating conditions usually require regular zero point calibrations, all of which are performed automatically in combination with the AccuFlo®-Zero option.

Due to its optionally variable length, the installation is possible without welding works by simple replacing the existing measurement system.



AccuFlo® HMP ST – Highly accurate fiscal measurement for steam

In the steam sector, the AccuFlo® HMP ST offers the possibility to measure mass and energy flow of steam accurately and traceably. Discussions about precision are a thing of the past.

Since the calibration of measurements with steam is almost impossible, it was normal in the past to use measuring devices that are not traceable to calibration standards for the fiscal metering of steam flow. This is very different with the AccuFlo® HMP ST. Due to the measuring principle the results of the water calibration can be transferred to steam measurements without limitations. This ensures a high accuracy and 100% traceable steam measurement for the end user.

The AccuFlo® HMP ST can even be used in very compact pipe networks due its short installation length and furthermore it requires no additional straight in- and outlet sections to achieve the specified accuracy.

The measurement system can also be equipped for completely maintenance free operation. Changes in ambient and operating conditions usually require regular zero point calibrations, all of which are performed automatically in combination with the AccuFlo®-Zero option.

The mass flow meter is easy to install and due its variable length it offers great flexibility when it comes to upgrading facilities or replacing existing flow meters.



AccuFlo® HMP L – highly accurate accounting measurement for special fluids

In the field of flow measurement of liquids various flow measurement methods are available. In particular for conductive water the list of available devices is very long. For specific requirements for the measurement of low-viscosity or non-conductive liquids at high temperature and high pressure this list is much shorter. The search is getting more difficult if these specifications are combined with the requirement of very high accuracy. In these cases the AccuFlo® HMP L is the first choice.

The measurement of a flow of thermal oil or supply water at 300 ° C with an error margin of up to 0.3% of the measured value in a span ratio of 1:15 are typical applications here. Also regarding the process pressure, there are no restrictions for pressures up to PN160.

The AccuFlo® HMP L can even be used in very compact pipe networks due its short installation length and furthermore it requires no additional straight in- and outlet sections to achieve the specified accuracy.

The measurement system can also be equipped for completely maintenance free operation. Changes in ambient and operating conditions usually require regular zero point calibrations, all of which are performed automatically in combination with the AccuFlo®-Zero option.

The mass flow meter is easy to install and due its variable length it offers great flexibility when it comes to upgrading facilities or replacing existing flow meters.

SK | AccuFlo[®] HMP – Principle of operation

The AccuFlo[®] HMP ST is a high accuracy differential pressure mass flow meter. The special design of the measuring sensors results in a combination of high accuracy with low-pressure drop and cost-efficiency in an optimal way.

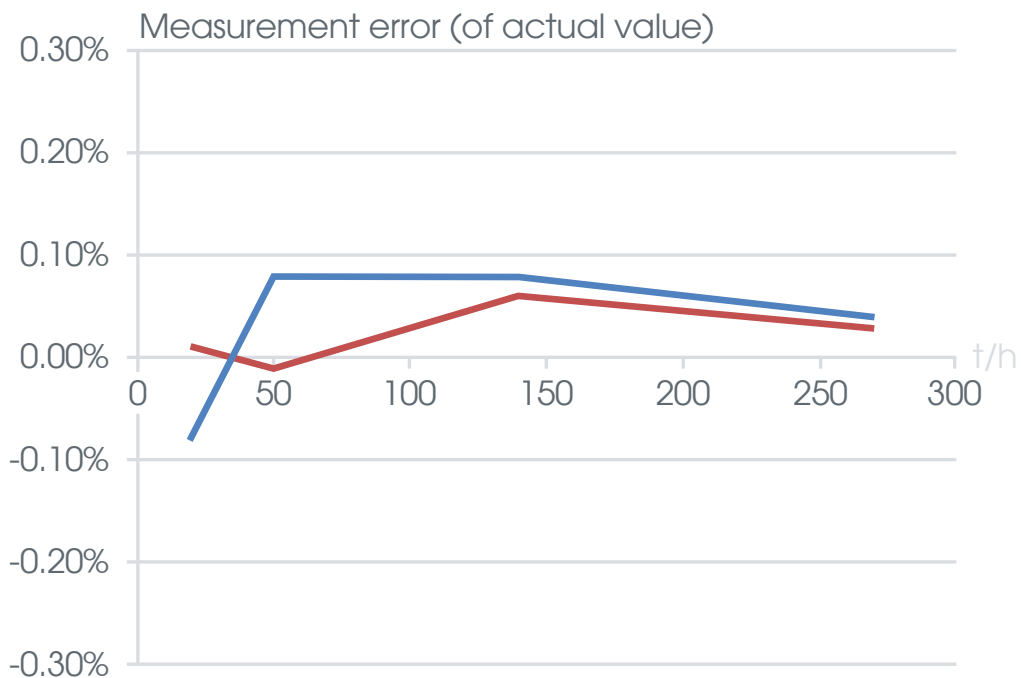
The overall maximum measurement error under reference conditions is +/- 0.3% of the measured value for liquid and gaseous media and 0.5% of the measured value for steam. When using the AccuFlo[®]-Zero option the error limits are usually met even taking into account the usual factors such as changes in fluid and ambient temperature, media pressure and the long-term drift of the electronic differential pressure transmitter.

The diagram below shows a typical calibration curve for water. Due to the physical relations these results can be applied without restrictions to compressible media if the expansion factor is taken into account. The AccuMind serves as flow computing unit of the AccuFlo[®] HMP and per-

forms all necessary calculations to achieve the highest accuracy.

The graphic below demonstrates the independence of the measurement result of inlet and outlet section. The AccuFlo[®] HMP can be operated largely without inlet and outlet sections and is therefore suitable for fiscal metering applications in complex piping systems and in extremely compact installations.

The use of the AccuFlo[®]-Zero option offers complete freedom from maintenance in addition to increased accuracy. Changes in ambient and operating conditions usually require regular zero point calibrations, all of which are performed automatically in combination with the AccuFlo[®]-Zero option.



Intelligent Sensor Alignment

The combination of flow conditioning and fine-meshed sampling of the flow profile provides a stable measuring signal that is largely independent of inlet disturbance over a wide measuring range. The flow-optimized design ensures low-pressure losses resulting usually in a static pressure drop smaller than 21% of the generated differential pressure.

Your benefits:

- Very high accuracy
- Large dynamic measurement range
- Compact design of your installation, since no straight inlet and outlet sections are necessary
- Low operating costs due to low pressure losses



Digital Communication between Differential Pressure Transmitter and Flow Computer

In most differential pressure flow measurements the communication between the differential pressure transmitter and the flow computer electronics are based on analog signals. Due to the quadratic relationship between flow and differential pressure this results in severely limited accuracy at low flow. Digital communication (e.g. via PROFIBUS) requires special differential pressure transmitters and processing electronics which lead to a significant increase in cost. This is different with the AccuFlo® HMP where communication between transmitter and flow computer is purely digital – without additional cost for the end-user.

Your benefits:

- High accuracy (measurement error of 0.3% of measured value for gas, 0.5% for steam) Due to digital communication there are virtually no extra costs
- Large dynamic measurement range (typically 1:15) without additional device- and installation effort

Next Generation Flow Computer

The flow computer can be operated intuitively via the freely configurable capacitive touch-screen display. For accurate mass flow metering it features all relevant international regulations such as calculation AGA8 DC92 (Detailed Method), ISO20765, SGERG-88, AGA-NX19 and IAP-WS97. Integration into almost all available bus systems such as Modbus, Profibus and Profinet is possible due to the AnyBus-module.

Your benefits:

- Highly accurate measurement of natural gas according to virtually all applicable standards
- Can be integrated in virtually all Fieldbus systems
- Steam flow measurement according to current standards



Optional Automatic Zero Point Calibration

Zero calibration is performed as required depending on ambient temperature and / or media pressure fluctuations. In addition, a zero point calibration is performed to avoid measurement errors due to the long-term drift of the differential pressure transmitter.

Your benefits:

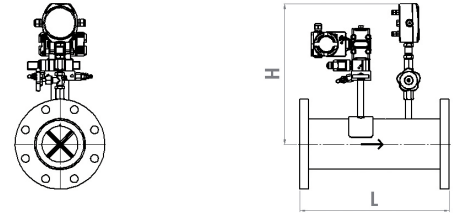
- High accuracy under realistic process conditions
- Maintenance free
- Accurate measurement even at low flow due to the extended dynamic measurement range



Liquid gas flow measurement

Nominal width	Length L* (mm)	Height H (ca. mm)	Weight G (ca. kg)
DN 80	500	435	See table as it depends on the pressure stage
DN 100	500	450	
DN 125	500	460	
DN 150	500	475	
DN 200	600	500	
DN 250	700	530	
DN 300	800	555	

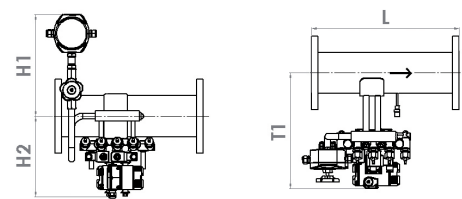
* Total Length L can be differ according to the customer's wishes



Steam measurement horizontal

Nominal width	Length L* (mm)	Height H ₁ (ca. mm)	Height H ₂ (ca. mm)	Depth T ₁ (ca. mm)
DN 80	500	325	255	375
DN 100	500	340	265	385
DN 125	500	340	280	400
DN 150	500	365	295	415
DN 200	600	390	320	440
DN 250	700	420	345	465
DN 300	800	445	370	490

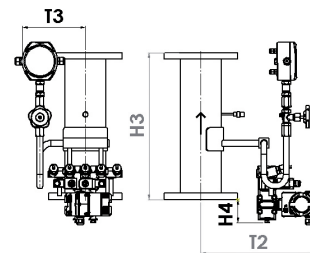
* Total Length L can be different according to what the customer wants



Steam measurement vertical

Nominal width	Length H ₃ (mm)	Height H ₄ (ca. mm)	Depth 1 T ₂ (ca. mm)	Depth 2 T ₃ (ca. mm)
DN 80	500	80	375	195
DN 100	500	80	385	210
DN 125	500	80	400	220
DN 150	500	80	415	235
DN 200	600	25	440	260
DN 250	700	-	465	290
DN 300	800	-	490	315

* Total Length H₃ can differ according to the customer's wishes



Weights of gas- and liquid measurements (Standard Length)

DN	PN6	PN10	PN16	PN40	PN63	PN100
80	30	32	32	33	37	41
100	36	38	38	42	46	52
125	46	48	48	53	61	73
150	58	63	63	70	84	98
200	92	97	98	114	140	166
250	144	150	154	185	212	267
300	213	217	227	280	311	403

Weight steam measurement (Standard Length)

DN	PN6	PN10	PN16	PN40	PN63	PN100
80	33	35	35	36	40	44
100	39	41	41	45	49	55
125	49	51	51	56	64	76
150	61	66	66	73	87	101
200	95	100	101	117	143	169
250	147	153	157	188	215	270
300	216	220	230	283	314	406

Measuring section

Material section	16Mo3, optional 1.4571
Material sensor	Mat.no. 1.4571
Nominal pressure	PN10 - PN160
Temperature range	-20° to +150° C (optional +400° C)
Suitable insulation	max. 100mm (provided by the customer)
Main dimensions	see table

Signal processing

Differential pressure	2-conductor, 4-20 mA and digital Protection: class IP 65
Pressure	2-conductor, 4-20 mA Protection: class IP 65
Temperature	Pt100 Class A, 3 - conductor

Evaluation unit

Display	4, 3" WQVGA Colour TFT Display
Operation	capacitive touch operation
Calculation algorithms	ISO51767, AGA3, IAPWS97, AGA8, SGERG88, AGA NX19
Analog output	(0)4-20 mA
2nd. analog output (optional)	(0)4-20 mA
Relay outputs (optional)	1 x 230 VAC, 6 A, max. 2 Hz, Func- tion selectable 1 x 48 V AC, 60 V DC, 120 mA, max. 150Hz, func- tion selectable (also counting pullse)

Bus-output (optional)	MOD-Bus
Network	Ethernet interface
Auxiliary energy	115/230 VAC +10% - 14% / 24 VDC, 5%
Protective enclosure/ Protection class	Switch panel mounting ca. ca. 144 mm x 72 mm x 155 mm; WxHxD, Protection: class IP54

Error limits

Linearity	Gas and liquids typically: 0.3% the measured value steam : typically: 0,5% of the measured value depending on setting, negligible if using AccuFlo®- Zero option
Error due to changes in ambient temperature	

Evaluation limits

Measuring range	selectable in wide limits
Measuring span ratio	typically: 1:15 optionally: 1:40 (possible depen- ding on applica- tion)

Mechanical construction

Design, manufacture, testing	according to DGRL and testing DIN EN 13480
Flanges	according to EN 1092, Form B1 or ANSI B16.5 Form RF

AccuFlo® HMP

Type of medium

G	Gas
ST	Steam
L	Liquid

Nominal width (EN 1092, ANSI B16.5)

40	DN40 / 1"
50	DN50 / 2"
65	DN65 / 2"
80	DN80 / 3"
100	DN100 / 4"
125	DN125 / 5"
150	DN150 / 6"
200	DN200 / 8"
250	DN250 / 10"
300	DN300 / 12"

Pressure stage (EN 1092, ANSI B16.5)

10	PN10	(available from DN250/10")
16	PN16 /class#150	(available from DN100/4")
40	PN40 /class#300	
63	PN63 /class#400	
100	PN100 /class#600	
160	PN160 /class#900	

Version

DC	nach EN 1092, 16 Mo3
AC	nach ANSI B16.5, 16Mo3
DE	nach EN 1092, stainless steel
AE	nach ANSI B16.5, stainless steel

Pipeline layout - flow direction

H	Horizontal
VS	Vertical - rising
VF	Vertikal - falling

Pipeline layout - flow direction

A2	Second analog output
R2	Two relay outputs
ME	measuring range extension (1:40)
EX	EX-version with feed separator (correction calculator without EX)
24	24 V DC - Version
AZ	AccuFlo® Zero
X	Further option - plain text input successful



S.K.I. Schlegel & Kremer Industrieautomation GmbH

P.O. Box 41 01 31
D-41241 Mönchengladbach

Hanns-Martin-Schleyer-Straße 22
D-41199 Mönchengladbach

Phone: +49(0)2166-62317-0
Fax: +49(0)2166-62317-99
Web: www.ski-gmbh.com
Email: info@ski-gmbh.com

VAT Reg. No. De 811 352 712
Mönchengladbach District Court Companies Register HRB 4470

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